



CHP in North Carolina

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Today's Talk

- Barriers, Incentives and CHP
- CHP - Current and Potential in NC
- NC CHP Applications Center



Barriers, Incentives and CHP



A Murky Energy Future

- Higher capital spending on poorly maintained energy infrastructure
- FERC ordered restructuring of Electricity Markets (SMD)
- Homeland Security
- Volatile oil prices
- Higher price volatility
- Lower capital availability
- Middle East Conflict
- Rethinking of deregulation policies post CA debacle and Enron implosion
- 2002 Federal legislation?
- An unprecedented higher dependency on IT and emerging technology for efficiency improvements and lower costs
- Boom-Bust Merchant Plant Development Plans



Policymaker Interest

- Improved reliability of the grid
- Reduced environmental impact
- Climate change mitigation
- Lower energy costs?
- Increased energy efficiency
- Promotion of RE / NC GreenPower



Barriers to CHP

- Unreasonable interconnect requirements
- High standby/back-up power costs
- Stranded cost recovery on kWh generated
- Environmental benefits not valued
- Siting and permitting delays/uncertainties
- Non-core business investment for the customer

Renewables Incentives

- The NC State's Solar Center hosts DSIRE - a comprehensive source of information on state, local, and utility incentives that promote renewables
- www.dsireusa.org





NC Tax Credits

- **35% - HIGHEST IN THE NATION**
 - Up to **\$10,500** for residential photovoltaic or solar electric systems
 - Up to **\$3,500** for residential passive and active solar space heating systems
 - Up to **\$1,400** for solar water heating systems
 - Up to **\$250,000** for all solar, wind, hydro and biomass on commercial and industrial facilities
 - Utilization data available from 2000 - present available next week

NC GreenPower



- Unique statewide program
- Will sell a mix of resources in “blocks” to consumers
- New idea to offer a commercial product for bulk purchasers



Key Policy Needs for Renewables in NC

- ***Green Power Purchases*** to support market development
- ***Public Benefit Fund*** to Support Market Emergence and Development
- ***Portfolio Standard*** to encourage near market renewables (green power alone won't cut it)
- ***Net metering & Simplified Interconnection*** to support small scale DG, PV and Wind
- ***Public Building Requirements*** to raise awareness, supply GP and show state leadership

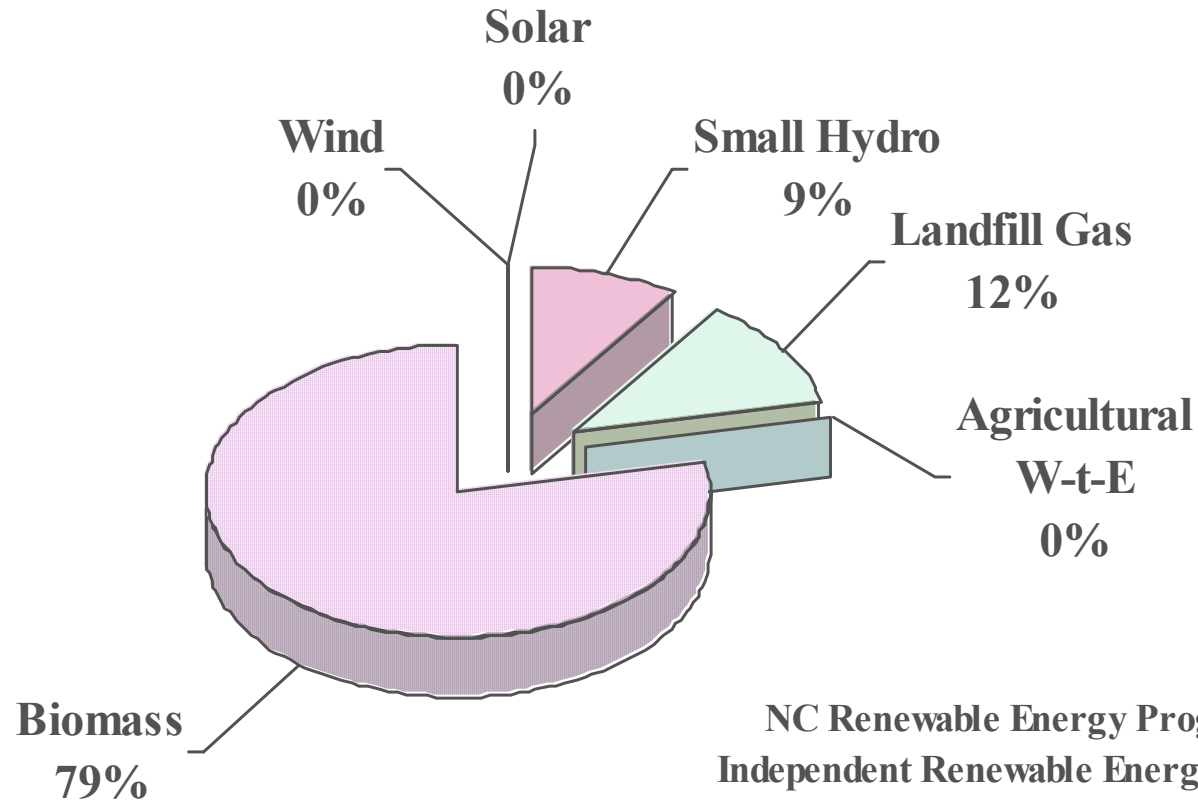
CHP - Current and Potential in NC

- Short-rotation woody crops
- Wood Boilers: burning scrap wood
- Digesters: producing methane from agricultural and animal waste and burning it
- Land Fill Gas (methane): being collected at landfills and burned
- 300+ MW currently in NC



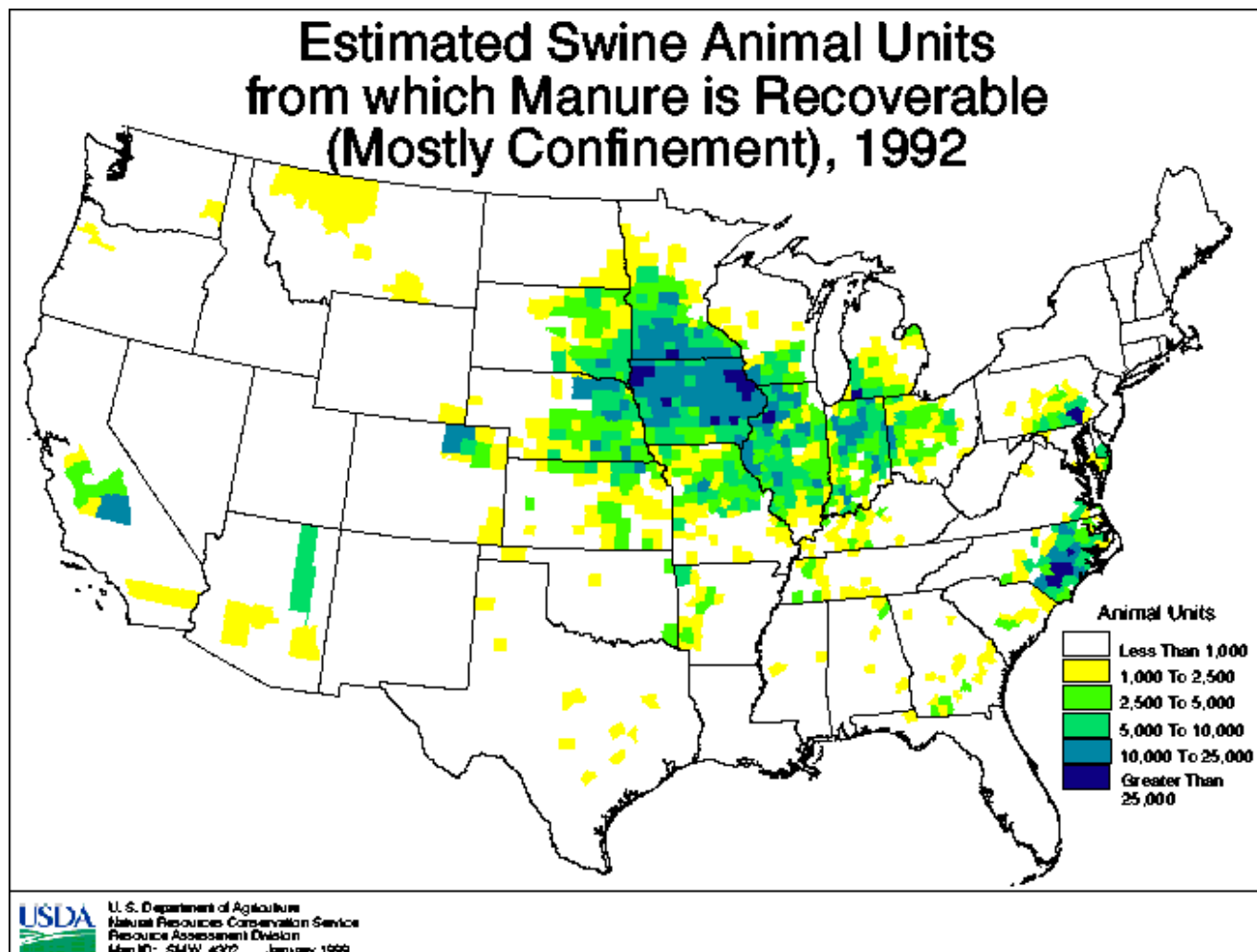


NC Independent Renewable Energy Production

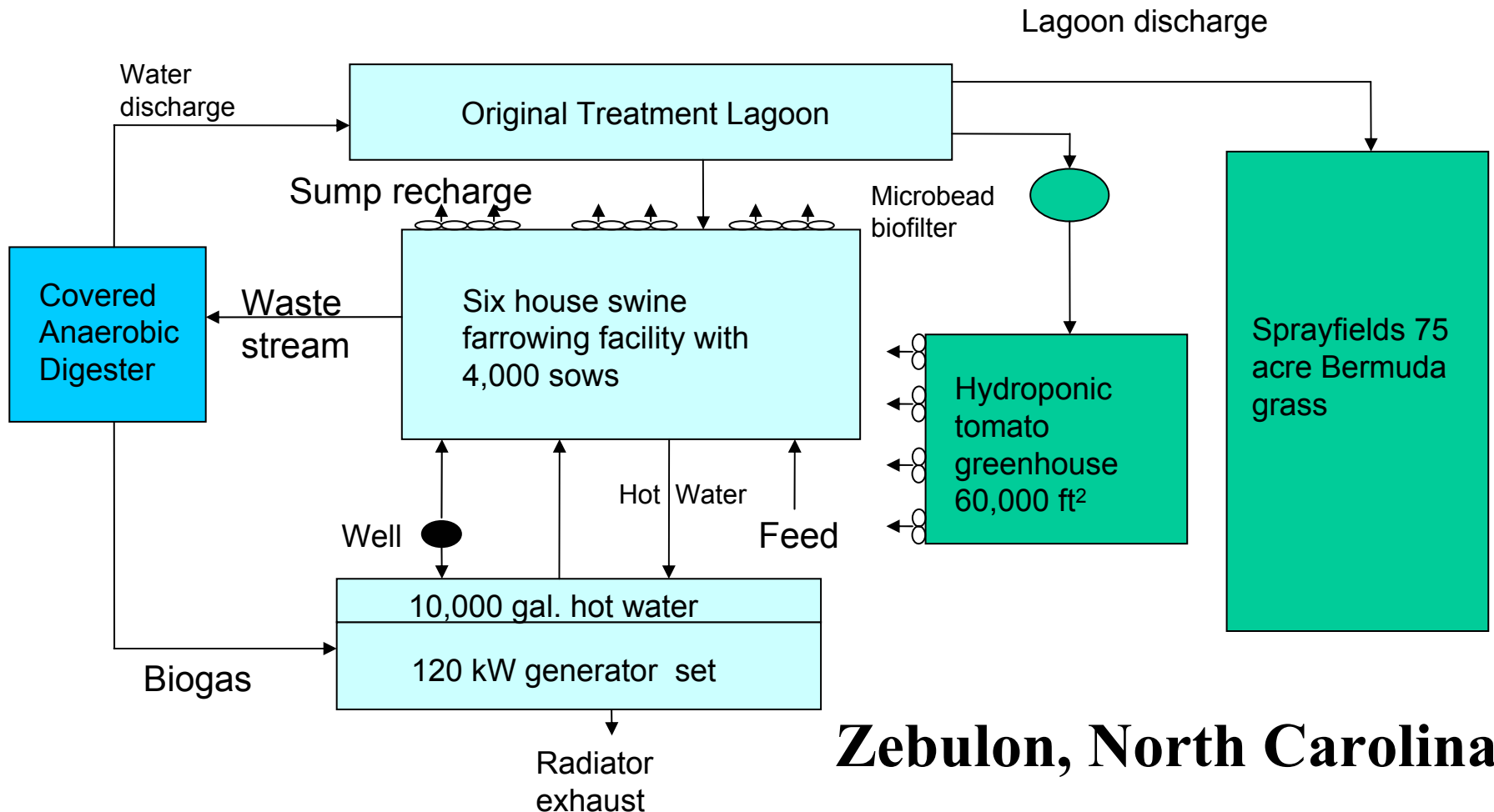


NC Renewable Energy Program
Independent Renewable Energy - 2000
Report to NC GreenPower Advisory Committee
(Givens, McGough, 11/2001)

Swine Waste



Barham Farms



In-ground Covered Anaerobic Digester

- Nutrients reduction
- Biogas production average 16 MM Btu/day



Engine-Generator Set



- Combined heat and power usage
- 120 kW generator, 10,000 gallons hot water

UNC - Chapel Hill CFB Cogeneration Plant





UNC-CH CFB Cogeneration Facility

Boilers

2 X 250,000 lbs/hr
circulating fluidized bed boilers

District Cooling

- North Chiller Plant
 - 9,000 centrifugal
 - 4,500 tons low pressure absorption
- South Chiller Plant
 - 4,000 centrifugal
 - 3,000 tons low pressure absorption
- UNC Hospitals
 - 3,600 tons centrifugal
 - 3,600 tons low pressure absorption

Steam

1275 psig, 900 deg F

Turbine

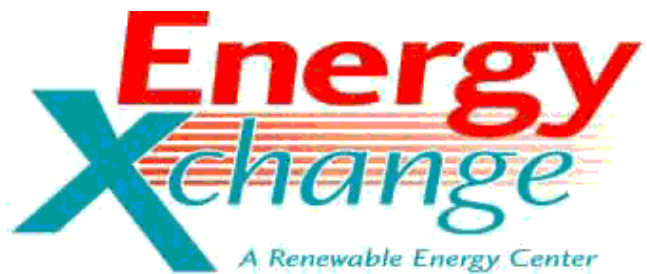
28 MWe double automatic extraction
steam turbine generator with 10 MWe
condensing capability and remainder
going to Heating, Cooling, Hot Water,
Sterilization, Cooking/Dishwashing

Generator

Electricity
28 MWe



OPEN 1972-1994
300,000 TONS
6 ACRES
LFG SYSTEM 1999



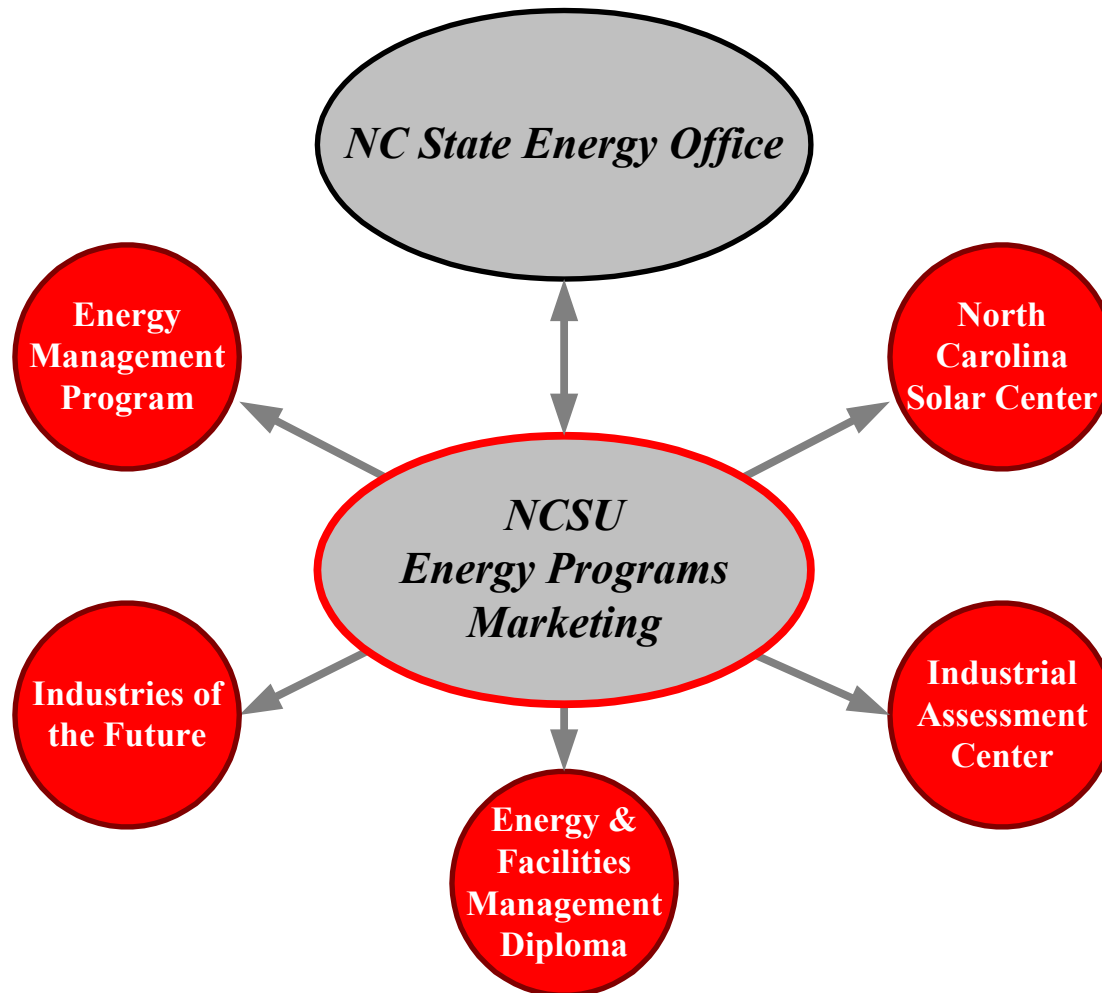
Buildings, greenhouses
glassblowing and ceramics kiln
heated by LFG. Microturbines
will be installed next year.





NC CHP Applications Center

Energy Programs at NC State





NC CHP Program Goals

- Promote CHP technology in North Carolina's industrial, agricultural and building sectors
- Encourage use of in-state renewable energy resources
- Boost local economic development



Activities

- Establish NC CHP Application Center at NCSU
- Develop CHP demonstration projects
- Evaluate economic drivers
- Provide technology evaluation and transfer
- Work with other in-state CHP interest



For More Information

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